

Claims

[c1] What is claimed is:

1.A low-to-high level shifter operating under a first supply voltage, the low-to-high level shifter comprising:
a pull-down circuit coupled to an input signal, the input signal corresponding to a second supply voltage;
a pull-up circuit coupled to the pull-down circuit; and
a clamping circuit coupled to the pull-down circuit, for clamping an operating voltage of the pull-down circuit;
wherein the low-to-high level shifter generates an output signal according to the input signal, the output signal corresponds to the first supply voltage, and the first supply voltage is larger than the second supply voltage.

[c2] 2.The low-to-high level shifter of claim 1 wherein the pull-down circuit comprises a plurality of low-voltage devices, and the pull-up circuit comprises a plurality of high-voltage devices.

[c3] 3.The low-to-high level shifter of claim 2 wherein the low-voltage devices have a lower turn-on characteristic than the high-voltage devices.

[c4] 4.The low-to-high level shifter of claim 1 wherein the

pull-down circuit comprises a first pull-down transistor and a second pull-down transistor, control terminals of the first and the second pull-down transistors are coupled to the input signal.

[c5] 5.The low-to-high level shifter of claim 1 wherein the pull-up circuit comprises a first pull-up transistor and a second pull-up transistor, a control terminal of the first pull-up transistor is coupled to a first terminal of the second pull-up transistor, and a control terminal of the second pull-up transistor is coupled to a first terminal of the first pull-up transistor.

[c6] 6.The low-to-high level shifter of claim 5 wherein the output signal is extracted from the first terminal of the first pull-up transistor.

[c7] 7.The low-to-high level shifter of claim 5 wherein the first terminals of the first and the second pull-up transistors are coupled to the pull-down circuit.

[c8] 8.The low-to-high level shifter of claim 1 wherein the clamping circuit comprises a first clamping transistor and a second clamping transistor, control terminals of the first and the second clamping transistors are coupled to a bias voltage.

[c9] 9.The low-to-high level shifter of claim 1 wherein the

input signal is coupled to the pull-down circuit via an inverter operating under the second supply voltage.

[c10] 10. A low-to-high level shifter operating under a first supply voltage, the low-to-high level shifter comprising: a pull-down circuit coupled to an input signal, the pull-down circuit comprising a plurality of low-voltage devices, the input signal corresponding to a second supply voltage; and a pull-up circuit coupled to the pull-down circuit, the pull-up circuit comprising a plurality of high-voltage devices; wherein the low-to-high level shifter generates an output signal according to the input signal, the output signal corresponds to the first supply voltage, and the first supply voltage is larger than the second supply voltage.

[c11] 11. The low-to-high level shifter of claim 10 further comprising: a clamping circuit coupled to the pull-down circuit, for clamping an operating voltage of the pull-down circuit.

[c12] 12. The low-to-high level shifter of claim 11 wherein the clamping circuit comprises a first clamping transistor and a second clamping transistor, control terminals of the first and the second clamping transistors are coupled to a bias voltage.

- [c13] 13.The low-to-high level shifter of claim 10 wherein the pull-down circuit comprises a first pull-down transistor and a second pull-down transistor, control terminals of the first and the second pull-down transistors are coupled to the input signal.
- [c14] 14.The low-to-high level shifter of claim 10 wherein the pull-up circuit comprises a first pull-up transistor and a second pull-up transistor, a control terminal of the first pull-up transistor is coupled to a first terminal of the second pull-up transistor, and a control terminal of the second pull-up transistor is coupled to a first terminal of the first pull-up transistor.
- [c15] 15.The low-to-high level shifter of claim 14 wherein the output signal is extracted from the first terminal of the first pull-up transistor.
- [c16] 16.The low-to-high level shifter of claim 14 wherein the first terminals of the first and the second pull-up transistors are coupled to the pull-down circuit.
- [c17] 17.The low-to-high level shifter of claim 10 wherein the input signal is coupled to the pull-down circuit via an inverter operating under the second supply voltage.
- [c18] 18.The low-to-high level shifter of claim 10 wherein the

low-voltage devices have a lower turn-on characteristic than the high-voltage devices.